teus, from Africa. The wings, drawn out from beneath the elytræ, measured four and one half inches from tip to tip.

The following named gentlemen were elected Resident Members, viz: Alfred E. Giles, I. T. Talbot, of Boston; Ambrose Wellington of Cambridge, A. T. Cummings of Roxbury, and Edwin Harrison of the Lawrence Scientific School.

November 5, 1856.

The President in the Chair.

Dr. David F. Weinland read the following paper, entitled

OBSERVATIONS ON A NEW GENUS OF TÆNIOIDS.

In the middle of April, 1856, I found a single living specimen of a new kind of tapeworm in the small intestine of our gold-winged woodpecker (*Picus auratus*). This Tænia is remarkable for the structure of its organs of reproduction.

As in the human tapeworm (*Tænia solium*), so also in this, the genital openings alternate from one articulation to the next; but in the former, and as seems generally to be the case in Tænioids, the testicles lie in the middle of each articulation. (See Von Siebold, Vergleichende Anatomie der wirbellosen Thiere, p. 147; and the figure in Blanchard, Recherches sur l'organization des Vers, pl. 15; f. 4, 7.) They were placed, on the contrary, in the tapeworm of the woodpecker, in the anterior part of the articulation, just in front of the genital opening, filling up by a large mass of convolute spermatic canals all that part of the articulation, and thus excluding from it the uterus. Furthermore, the uterus did not consist of branched, treelike canals, (see Blanchard, l. c.) but on the contrary of a large number of balls, perhaps connected with each other by slender ducts. Von Siebold, l. c. p. 146, and note 23, seems to speak of a similar structure observed by him or Dèlla Chiaje in *Tænia ocellata*, and Dujardin (Histoire naturelle des Helminthes, Paris, 1845) has observed exactly the same structure of the uterus in a tapeworm of the European *Picus major*.

As in other tapeworms, the spermatozoa were very fine, filiform, of one diameter throughout, without the so-called head or body of other spermatozoa. But what was very strange, these spermatozoa were of very different lengths; some twice, thrice, or even four times as long as others. Moreover, they would readily break into pieces, and were not so soft and pliable as they generally are. I saw several break into two pieces, (particularly when coming out from the cirrus-bag,) and both pieces moved on. Whether this phenomenon occurred accidentally, or whether it was a natural characteristic of these spermatozoa, I am at a loss to say. No water was used in the examination, of the bad effects of which upon spermatozoa I am fully aware. In either case this is a subject worthy the investigation of physiologists; for such a power of division would imply a nature in these spermatozoa entirely different from what we have hitherto observed. Other spermatozoa present *individual* elements; on the contrary, those of this tapeworm would be really *dividual*, at least virtually, as they have the faculty of dividing and thus multiplying themselves. Not the slightest difference could be observed, in activity, movement, or form, between the divided portions and the whole animals; so that we may suppose, that each of the divided pieces had the fructifying power, as well as the others. Furthermore, the motion of these spermatozoa was extraordinary. Whilst others move in a peculiar, quick, vibratory manner, these progress much more slowly, in a succession of long curves, reminding one of the motion of an eel at the bottom of a river.

This same tapeworm is also remarkable for the strange shape of its *eggs*. While the eggs of tapeworms generally are globular or oval, the shape of these was that of a large ball running out on both sides into tubes which terminated in balls, of about half the diameter of the central one. I found these eggs in all stages of development, some containing nothing but a clear yolk, while others presented embryos with six little spines. The yolk as well as the embryo was found only in the central ball, and there also the yolk membrane terminated. Thus the lateral tubes of the egg, as well as the balls in which they terminated, are to be considered merely as excrescences and appendages of the outer (the third) coating of the egg. Similar appendages to the eggs of tapeworms have been met with previously by other observers; namely, threads running out on two sides in *Tænia infundibuliformis* and *planiceps* by Von Siebold, (l. c. p. 148,) and *Tænia cyathiformis* by Dujardin, (l. c. p. 568, and figured Pl. 9, Fig. R. 2,) while Von Siebold (l. c.) describes the eggs of the same worm as provided at the pointed ends of their outer pear-shaped coatings, with two bladder-like appendages, which remind one more of the new form just described. Two delicate tufts, one on each side, have been observed by Meissner in *Mermis nigrescens* (Beitraege zur Anatomie und Physiologie der Gordiaceen, in Von Siebold and Kölliker's Geitschrift fur Wiss. Zool. VII. Taf. II., Fig. II.) and by Siebold, l. c. in *Tænia variabilis*. All these appendages belong to the third coating of the egg, adjoining the so-called chorion. Analogous appendages are found in the eggs of sharks and skates. Some of the embryos were hatched under my eyes, and, in spite of the greatly different organization of the adult worms, their organization was seen to be throughout identical with that of the embryos of the genuine Tænias, (those of man, dog, cat, etc.) namely, a roundish disk, containing smaller and larger granules, and provided with six little spines, disposed in three pairs, two lateral and one in front. We might ask here, is it only the simplicity of organization which causes this similarity of such incipient organisms, which are so distant from each other when adults? or is it perhaps rather the real and material expression of the ideal unity of such a type (that of Tænioids, for instance)? The embryos of all Dicotyledonous plants start with a little root and two leaflets, whatever difference they may exhibit, when full grown, in relation to the organs of nutrition, respiration, or reproduction; they may have the complicated flowering of a rose, or the simple perigon of an oak. Thus every Dicotyledonous embryo exhibits materially the unity of that great diversified type. Again the simple cell, from which both animals and plants originate, represents materially that ideal unity which embraces all living beings. If this be so, the question arises, can we extend this principle, which has already laid open or strengthened such natural divisions as Dicotyledonous and Monocotyledonous plants, over all natural groups? Is it the standard of every type or group? Is it the proof of its foundation in nature, that its members exhibit materially their unity by identity of organization at any time of their embryonic development? We think that it is impossible to answer this question for want of embryological data, but in relation to the Tænioids, which we will call a family, its truth is remarkably evident. We form a natural group of all those Tænias, the embryos of which show that disk-like body with six spines. We might call them Hexechinidæ. Many genera with very different structure in relation to the reproductive organs, the number and disposition of the hooks, the form of the proboscis, &c. &c., are included in it. Even their forms when adult are not the same, but we have a doubt whether we ought not, in basing, as Agassiz has taught us, families upon forms, to make, at least in the lower animals, this allowance, that the guiding form is often not exhibited in the adult animal, but only in a much earlier, perhaps in its embryonic state. We allude here particularly to all those animals in which an alternation of generation is observed, such as Cirripeds, etc.

The *new genus*, which we found upon the structural peculiarities mentioned above, we will call *Liga*, and the species, from its many yellowish-brown dots, *punctata*.

A full description of both genus and species, with drawings, will be given on some future occasion.

Dr. Gould asked if there is around the mouth of the common tapeworm (*Tænia solium*) a row of hooks, as is commonly figured in descriptions of the head of this animal.

Dr. Weinland replied that there is a row of hooks at the base of the proboscis, which move with the invagination of this organ, and which consequently may appear in different positions.

Dr. Gould asked where the embryos of the tapeworm were obtained.

Dr. Weinland replied that they exist in the articulations of the old worm, in all stages of development, and may be removed by incision and pressure upon the joint.

Prof. Agassiz observed that the ova of *Botriocephalus latus*, which is common in Switzerland, may possibly be introduced into the human body by the vegetables used for salad, which are manured with liquid taken directly from the vaults. He was not aware, however, of the ova having been found upon the plants.

Dr. Weinland, in reply to a question as to the manner in which these animals reach the brain and other organs, answered that he had seen, in one instance, a passage through a membrane without any trace being left in it; and that it was not impossible that penetration could be effected through many tissues and to a considerable distance.

Prof. Agassiz remarked that, at a previous meeting, he had stated that it would probably be found necessary to divide what is now called the Class of Fishes into several distinct classes.

He could not yet say what position the Ganoïds would take,—whether that of a separate class or of an order;—but it is certain that they form a natural group. Sturgeons and gar-pikes belong together, though they differ so much in external appearance; and Prof. Agassiz gave, as one of the points of resemblance serving to unite the two, the manner of development of the scales. The small gar-pikes, (*Lepidosteus*,) recently exhibited by him, presented scales just beginning to form. In the youngest specimen there was a row along the middle line of the body; in another, more advanced in age, there was a row of scales above and below the median line also, where the scales first appear. Towards the tail the scales were crowded together, and were of a rhomboidal form, covering the posterior lobe of the body, and extending to the fin rays. The same method of development Prof. Agassiz had noticed in the sturgeon, and the same rhomboidal scales upon the tail. He expects to find the mouth beneath the snout in the embryo Lepidosteus, as it is in the sturgeon, and still other coincidences in the embryonic form.

The President inquired in what order the scales appear in osseous fishes.

Prof. Agassiz replied that he could not answer. He had seen the scales in Salmonidæ extremely small, but never at a sufficiently early period to determine the order of development.

Mr. James E. Mills gave the results of an investigation made under the direction of Prof. Agassiz, to determine